

What is claimed:

1. A filter construction for use in a disk drive assembly, the filter construction comprising:

(a) a housing, configured for placement in a disk drive assembly containing a rotating disk, the housing comprising:

- (i) an air inlet and an air outlet; the air inlet of the housing configured to be positioned farther from the center of the rotating disk than the air outlet; and
- (ii) an air scoop and a channel connecting the air scoop with the air outlet; wherein the air scoop contains an opening that is positioned at a greater than 15 degree angle to the edge of the rotating disk, and the air outlet is substantially parallel to the edge of the rotating disk.

(b) an adsorbent filter element positioned within the housing and in fluid communication with the air inlet and the air outlet, the adsorbent filter element positioned to filter air entering the drive assembly; and

(c) a recirculation filter element positioned in the air channel between the air scoop and the air outlet to filter air circulating within the drive assembly; wherein the recirculation filter has a width exposed to air passing through the air channel, and the recirculation filter is positioned in the air channel so that the exposed width is greater than the air channel width at the recirculation filter position.

2. A filter construction for use in a disk drive assembly, the filter construction comprising:

(a) a housing defining an air inlet and an air outlet;

(b) an adsorbent filter element positioned within the housing and in fluid communication with the air inlet and the air outlet, the adsorbent filter element positioned to filter air entering the drive assembly; and

(c) a recirculation filter element positioned to filter air circulating within the drive assembly;

wherein the filter is configured for placement in a disk drive assembly containing a rotating disk, and the air inlet of the housing is positioned farther from the center of the rotating disk than the air outlet.

3. The filter construction according to claim 2, wherein the air inlet is configured for positioning outside an edge of the rotating disk and the air outlet is configured for positioning inside the edge of the rotating disk.

4. The filter construction according to claim 2, wherein the air inlet is configured for positioning outside of an edge of the rotating disk by a distance of at least 0.1 times the radius of the rotating disk.

5. The filter construction according to claim 2, wherein the air inlet is configured for positioning outside of an edge of the rotating disk by a distance of at least 0.25 times the radius of the rotating disk.

6. A filter construction for use in a disk drive assembly, the filter construction comprising:

(a) a housing defining an air inlet, an air scoop, an air outlet, and a channel connecting the air scoop with the air outlet;

(b) an adsorbent filter element positioned within the housing and in fluid communication with the air inlet and the air outlet, the adsorbent filter element positioned to filter air entering the drive assembly; and

(c) a recirculation filter element positioned in the air channel between the air scoop and the air outlet to filter air circulating within the drive assembly;

wherein the filter is configured for placement in a disk drive assembly containing a rotating disk, and the air inlet of the housing is positioned farther from the center of the rotating disk than the air outlet.

7. The filter construction according to claim 6, wherein the air scoop contains an opening that is substantially perpendicular to the edge of the rotating disk and the air outlet is substantially parallel to the edge of the rotating disk.

8. The filter construction according to claim 6, wherein the recirculation filter has an exposed width to air passing through the air channel, and the recirculation filter is positioned in the air channel so that the exposed width is greater than the air channel width where the recirculation filter is positioned.

9. The filter construction according to claim 6, wherein the exposed width of the recirculation filter is at least 15 percent greater than the air channel width.

10. A filter construction comprising:

- (a) a housing defining an air inlet, an air scoop, an air outlet, and an air channel having a curved length connecting the air scoop and the air outlet; the air scoop having a width, the air outlet having a width, and the air channel having a width along its length between the air scoop and the air outlet, wherein at least at one position along the length, the width of the air channel is less than the air scoop width;
- (b) a diffusion channel in fluid connection with the inlet and the air outlet;
- (c) an adsorbent filter in fluid connection with the diffusion channel and the air outlet; and
- (d) a recirculation filter positioned in the air channel between the air scoop and the air outlet.

11. The filter construction according to claim 10, wherein the air outlet surface area is less than the air scoop surface area.

12. The filter construction according to claim 10, wherein the air outlet surface area is the same as the air scoop surface area.

13. The filter construction according to claim 10, wherein the air channel width is less than each of the air outlet width and the air scoop width where the recirculation filter is positioned in the air channel.

14. The filter construction according to claim 10, wherein the recirculation filter has a width exposed to air passing through the air channel, and the recirculation filter is positioned in the air channel so that the exposed width is greater than the air channel width where the recirculation filter is positioned.

15. The filter construction according to claim 14, wherein the exposed width of the recirculation filter is at least 15% greater than the air channel width.

16. A filter construction comprising:

- (a) a housing defining an air inlet, an air scoop, an air outlet, and an air channel having an interior wall and an exterior wall; the interior wall having a first curvature and the exterior wall having a second curvature, wherein at least one of the first curvature and the second curvature is concave;
- (b) a diffusion channel in fluid connection with the inlet and the air outlet;
- (c) an adsorbent filter in fluid connection with the diffusion channel and the air outlet; and
- (d) a recirculation filter positioned in the air channel between the air scoop and the air outlet.

17. The filter construction according to claim 16 wherein each of the first curvature and the second curvature is concave.

18. The filter construction according to claim 16 wherein the first curvature is the same as the second curvature.

19. The filter construction according to claim 16, wherein the air scoop has a width and the air outlet has a width, the air outlet width being less than the air scoop width.

20. A disk drive assembly comprising:

- (a) a disk drive enclosure and a disk positioned within the enclosure, the enclosure having an air port therethrough;
- (b) a filter construction positioned within the enclosure and in fluid communication with the port, the filter construction comprising:
 - (i) a first filter portion configured and arranged for positioning in an air stream to provide a path for flow of air into the disk drive enclosure, the air stream entering the disk drive enclosure through the port and exiting the first filter portion through a mouth; and
 - (ii) a second filter portion configured and arranged for positioning in an air current in the disk drive enclosure to provide a path for flow of air within the disk drive enclosure;

wherein when the disk is spinning, the disk drive enclosure has at least one low static pressure area and at least one high static pressure area, the port being positioned in the at least one high static pressure area and filter construction positioned in the enclosure so that the mouth is positioned in the at least one low static pressure area.

21. The disk drive assembly according to claim 20, wherein the mouth is positioned proximate a periphery of the disk.

22. The disk drive assembly according to claim 20, wherein the air stream exits the mouth of the filter construction approximately perpendicular to an edge of the disk.
23. The disk drive assembly according to claim 20, wherein the first filter portion comprises a diffusion channel.
24. The disk drive assembly according to claim 20, wherein the first filter portion comprises an adsorbent filter.
25. The disk drive assembly according to claim 20, wherein the second filter portion comprises a recirculation filter.
26. The disk drive assembly according to claim 20, wherein the second filter portion comprises an adsorbent filter.
27. A method of removing contaminants from a disk drive assembly, the method comprising:
- (a) positioning a filter construction at least partially within a disk drive assembly, the filter construction comprising:
 - (i) a first filter portion, and
 - (ii) a second filter portion;
 - (b) filtering an incoming air stream with the first filter portion, the incoming air stream entering the disk drive assembly through a port located in a high pressure area within the disk drive assembly and exiting the first filter portion in a low pressure area within the disk drive assembly; and
 - (c) filtering an internal air current with the second filter portion, the internal air current moving within the disk drive assembly.

28. The method according to claim 27, wherein the step of positioning a filter construction at least partially within a disk drive assembly comprises:

- (a) positioning a filter construction comprising a first filter portion comprising:
 - (i) a particulate filter; and
 - (ii) an adsorbent filter.

29. The method according to claim 27, wherein the step of positioning a filter construction at least partially within a disk drive assembly comprises:

- (a) positioning a filter construction comprising a first filter portion comprising a diffusion channel.

30. The method according to claim 27, wherein the step of positioning a filter construction at least partially within a disk drive assembly comprises:

- (a) positioning a filter construction comprising a second filter portion comprising:
 - (i) an adsorbent filter.